ON736 Oxygen/Nitrogen

Specification Sheet

Instrument Range*		
Oxygen:	0.0005 to 2 mg (0.5 ppm to 0.2% for a 1 g sample)	
Nitrogen:	0.0005 to 30 mg (0.5 ppm to 3.0% for a 1 g sample)	
Precision**		
Oxygen:	0.00025 mg (0.25 ppm) or 0.5% RSD, whichever is greater	
Nitrogen:	0.00025 mg (0.25 ppm) or 0.5% RSD, whichever is greater	
Calibration	Standards (single or multi-point); manual; gas dose‡	
Analysis Time		
Oxygen:	He: 85 seconds; Ar: 95 seconds (including outgas, purge, and analysis delay)	
Nitrogen:	He: 100 seconds; Ar: 130 seconds (including outgas, purge, and analysis delay)	
Cycle Time:	He: 180 seconds; Ar: 210 seconds (nominal)	
Sample Size	1 g (nominal)	
Detection Method	Non-Dispersive Infrared Absorption; Thermal Conductivity	
Chemical Reagents	• Anhydrous Magnesium Perchlorate ($Mg(ClO_4)$) • Sodium Hydroxide on an Inert Base	• Rare Earth Copper Oxide • Oxygen/Moisture Indicating Tube‡ • Copper‡
Gas Requirements		
Carrier:	He: (99.99% pure), 22 psi (1.5 bar) ±5%	Ar: (99.999%), 22 psi (1.5 bar) ±5%
Pneumatic:	Compressed Air, 40 psi (2.8 bar) ±10%, source must be oil and water free	
Gases Optional		
Gas Dose:	Carbon Dioxide, 99.99% pure, 20 psi (1.4 bar) ±10%	
Gas Dose:	Nitrogen, 99.99% pure, 20 psi (1.4 bar) ±10%	
Gas Flow Rates		
Carrier:	480 cc/minute	
Pneumatic:	280 cc/analysis	
Furnace	Impulse furnace with current and power control 7500 Watts maximum, liquid cooled	
Coolant	3.2 L LECO Coolant	
Operating Conditions		
Temperature	15 to 35°C (59 to 95°F)	
Rel. Humidity	20 to 80%, non-condensing	
Dimensions††		
Height:	36 in. (91.5 cm) nominal; 39.25 in. (100 cm) with load head cover lift engaged	
Width:	27.75 in. (71 cm)	
Depth:	30 in. (76 cm) without monitor; 31.5 in. (80 cm) with attached touch-screen monitor	
Electrical Power	230 V~ (+10/-15%; at max load); 50A, 50/60 Hz, Single Phase; 12,500 BTU/hr†	
Weight (approximate)	Analyzer: 400 lb. (181 kg) without touch-screen monitor	

Part Numbers	
ON736-XXXXC	Oxygen/Nitrogen Determinator with Windows®-based software and external PC

Options

NOTE: Multiple configurations of options are available. Please contact your local LECO Sales Engineer for more details.

- Optional mounted touch-screen monitor package (M)
- Optional autocleaner package (H)
- Optional performance package (P)
- Optional dual cooling upgrade package (D)

**Use the following formula to calculate element concentration:*
*% element concentration = ((absolute element mass in mg)/(sample mass in mg))*100*
***One sigma, conformance tested by gas dose analysis.*
†Average output based on nominal operating parameters.
††Allow for a 6 in. (15 cm) minimum access area around all sides.
‡Optional.

Delivering the Right Results

Theory of Operation

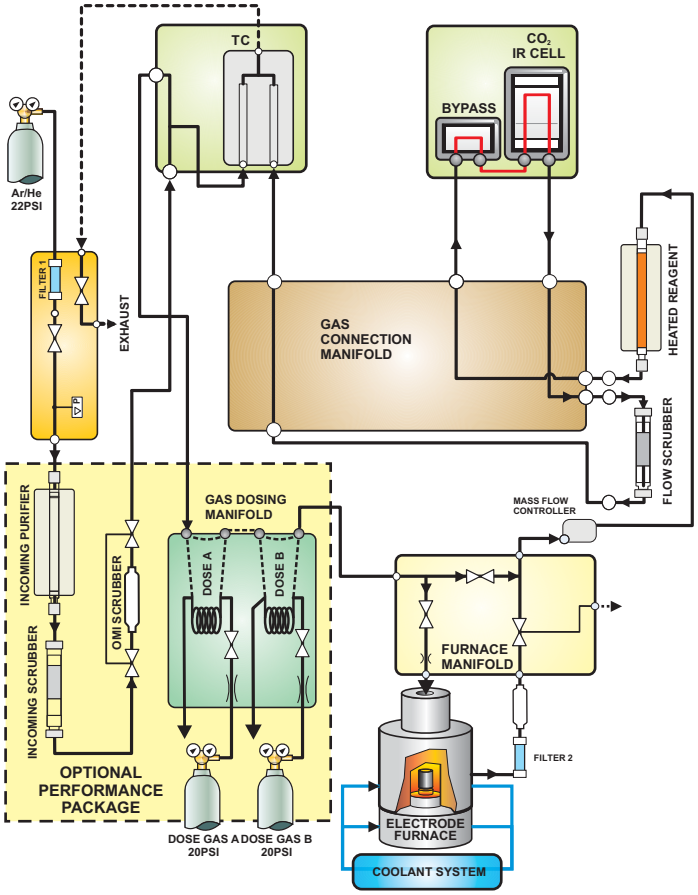
The ON736 Oxygen/Nitrogen system is designed for measurement of oxygen and nitrogen content of steel and other inorganic materials. The instrument features custom MS Windows-based software designed specifically for touch operation.

A pre-weighed sample is placed in a graphite crucible which is heated in an impulse furnace to release analyte gases. Oxygen present in the sample reacts with the graphite crucible to form CO and CO_2. An inert gas carrier, typically helium, sweeps the liberated gases out of the furnace and through a Mass Flow Controller. The gas then flows through a heated reagent, where the CO is oxidized to form CO_2, and H_2 is oxidized to form H_2O. Oxygen is detected as CO_2 using a non-dispersive infrared (NDIR) cell. CO_2 and H_2O are then scrubbed out of the carrier gas stream. A Thermal Conductivity (TC) detector is used to detect the remaining nitrogen.

The detection system is comprised of both NDIR and TC detectors. NDIR cells are based on the principle that analyte gas molecules absorb infrared (IR) energy at unique wavelengths within the IR spectrum. Incident IR energy at these wavelengths is absorbed as the gases pass through the IR absorption cells. TC detection takes advantage of the difference in thermal conductivity between carrier and analyte gases. Resistive TC filaments are placed in a flowing stream of carrier gas and heated by a bridge circuit. As analyte gas is introduced into the carrier stream, the rate at which heat transfers from the filaments will change producing a measurable deflection in the bridge circuit.

The concentration of an unknown sample is determined relative to calibration standards. To reduce interferences from instrument drift, reference measurements of pure carrier gas are made prior to each analysis.

Flow Diagram



Specifications and part numbers may change.
Consult LECO for latest information.
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LECO Corporation
3000 Lakeview Avenue • St. Joseph, MI 49085 • Phone: 800-292-6141 • Fax: 269-982-8977
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